

72. The process according to claim 71, wherein the glass threads are non-twisted and have a linear dilatation coefficient of $8 \text{ to } 9 \times 10^{-6}$.

73. The process according to claim 71, wherein the glass threads are cylindrical, have a circular cross-section with a diameter between 2 to 2.5 mm, and have a linear dilatation coefficient of 7.5×10^{-6} .

REMARKS

The Rejections

In the Office Action of November 25, 2002, the Examiner rejected all of claims 39-65 under 35 U.S.C. § 103(a) as being obvious in view of several prior art references, including Japanese Patent Publication No. 6-64076 ("Japan '076"). The Examiner also rejected claims 45-51, 55-57, and 61-65 under 35 U.S.C. § 112, second paragraph, as being indefinite and claims 45 and 61-65 under 35 U.S.C. § 112, first paragraph, as containing subject matter not described in the specification. In addition, claims 61-65 were rejected under 35 U.S.C. § 251 for improper recapture of subject matter surrendered in the application for the patent underlying this reissue application, U.S. Patent No. 5,670,007 ("the '007 patent"). Finally, claims 39-45, 52-54, and 58-64 were rejected for obviousness-type double patenting in view of claims 1, 3, and 11 of U.S. Patent No. 6,205,727 ("the '727 patent") and additional references.

The Amendments

This amendment cancels claims 46-51 and 55-57, amends claims 45, 61, and 65, and adds new claims 66-73. Attached as Appendix A is a rendering of the amended claims showing the

revisions with bracketing and underlining. Upon entry of this amendment, claims 39-45, 52-54 and 58-73 will be pending.

The reissue applicant submits that the amendments to these claims overcome the section 112 rejections. The reissue applicant submits that the amendment to claims 61 and 65 also address and overcome the section 251 rejections of claims 61-65. The reissue applicant respectfully traverses the Examiner's rejections based on the doctrine of obviousness-type double patenting and the prior art rejections under Section 103(a).

Section 112 Rejections

The reissue applicant has amended claims 45 and 65 in accordance with the Examiner's suggestions. Moreover, independent claims 64 and 65 have been amended to recite the first step as "providing a slab of stone material having a substantially smooth rear face free of grooves or recesses." This language is consistent with the language used in independent claim 39 of this reissue application and claim 1 of the '007 patent, and the claims no longer define the slab as being "substantially free of grooves or recesses."

The reissue applicant also has cancelled dependent claims 46-51 and 55-57. New claims 66-73 are patterned after cancelled claims 47-51 and 55-57, respectively. In accordance with the Examiner's suggestion that claims reciting the presence of grooves be made into independent form, these new claims depend from independent claim 65, which recites a step of forming grooves or recesses in the rear face of a slab that initially is free of such grooves or recesses.

The reissue applicant submits that the claims presented by this amendment overcome or obviate the section 112 rejections in the November 25 Office Action.

Rejections of Claims 61-65 Under the Recapture Rule

With the amendment of independent claims 61 and 65 as described above, claims 61-65 no longer lack the alleged omitted limitation of providing a stone slab that (a) has a substantially smooth face and (b) is free of grooves or recesses. Accordingly, the reissue applicant submits that the section 251 rejection has been overcome.

Double-Patenting Rejections

The reissue applicant continues to traverse the rejections of claims under the judicially created doctrine of obviousness-type double patenting with respect to claims 1, 3, and 11 of the '727 patent. This doctrine is not applicable to the current application, as no unjustified or improper extension of the reissue applicant's patent rights can result from the issuance of a reissue patent from this application. As pointed out in the reissue applicant's Amendment filed on October 17, 2002, the '727 patent issued from an application having an effective filing date in 1997, over eighteen months *after* the filing date of the application underlying the '007 patent and this reissue application. Accordingly, any claims issuing from this application would be subject to expiration well before the claims of the '727 patent.

Prior Art Rejections

The reissue applicant respectfully traverses the section 103(a) rejections set forth in the November 25 Office Action. All of the prior-pending claims 39-65 and all of the claims pending upon entry of this amendment recite a method in which one or more layers of **non-twisted** linear reinforcing elements coated with resin are applied to the rear face of a stone slab. The reissue applicant submits that none of the prior art references applied by the Examiner discloses this feature of reinforcing the slab with **non-twisted** linear reinforcing elements.

In the Amendment filed October 17, 2002, the reissue applicant presented arguments particularly directed to the reinforcing fibers 2 disclosed in Japan '076. These arguments were presented based on the presumption that the Examiner had inferred that Japan '076 taught the use of non-twisted fibers from its disclosure of the reinforcing fibers 2 being "arranged in one direction" or "oriented in one direction." In the November 25 Office Action, however, the Examiner now concludes that the layer 104 disclosed in Japan '076 is comprised of non-twisted reinforcing elements.

The basis for this conclusion appears to be the description of the layer 104 as being a "matting" of glass fibers. The Examiner, however, has not presented a single piece of prior art that shows the constituents of a reinforcing matting being non-twisted linear reinforcing elements, as recited in the reissue applicant's claims. In the absence of such a disclosure in the prior art, the reissue applicant submits that amended and new claims 39-45, 52-54, and 58-73 are patentable over the prior art of record.

The reissue applicant also disputes that Japan '076 teaches a method for producing a reinforced stone slab that utilizes a layer of non-twisted linear reinforcing elements coated with resin wherein the weight ratio of resin to reinforcing elements is 50:50 or less. Japan '076 discloses (in paragraph 0015) that the fiber-to-resin ratio can be in the range of 20:80 to 70:30. In essence, this wide range of ratios states nothing more than nominal levels of both resin and fiber are required. Importantly, in each of the examples presented in Japan '076, the ratio of resin to reinforcing fibers is more than 50:50. In Example 1, layer 102 has 60% resin and 40% fiber by weight, and layer 104 has 70% resin and 30% fiber (paragraph 0036). In both Comparative Example 1 and Comparative Example 2, the reinforcement has 60% resin and 40% fiber by weight (paragraphs 0041 and 0044). Japan '076 thus teaches that there is no criticality to the

ratio of resin to reinforcing fiber and strongly suggests from its examples that a ratio greater than 50:50 is preferred.

In contrast, the claims pending in this reissue application require a reinforcing layer that has two basic features: (a) the reinforcing elements are **non-twisted** linear reinforcing elements and (b) the reinforcing elements are coated by a resin the weight of which does not exceed the weight of the reinforcing elements. Applicant submits that the prior art applied by the Examiner does not teach or suggest this combination to one of ordinary skill in the art.

The particular combination identified above provides the solution to the problem addressed by the invention at issue here. As set forth in the background section of the '007 patent, prior art methods of reinforcing stone slabs provided the desired mechanical strength but failed to protect the stone from the hazards of differential thermal expansion:

Tests carried out heretofore have shown, however, that the thin slabs obtained using the aforementioned technologies, while being satisfactory from the point of view of the desired mechanical strength together with the primary objective of a limited thickness, still have a drawback arising from the difference in the thermal coefficient of expansion between the stone material and the resin used as a bonding agent.

This is obviously a drawback which was not foreseen since it was difficult to imagine that a slab of granite could become warped as a result of a difference between the thermal expansion of the granite itself and the thermal expansion of the layer of resin adhering to the rear face of the granite.

U.S. Patent No. 5,670,007, column 2, lines 45-57.

The solution to this problem resides in ensuring that the thermal expansion properties of the reinforcing elements predominate over those of the resin (glass fibers have thermal expansion properties close to those of stone slabs, while epoxy resins have coefficients of thermal expansion an order of magnitude greater than glass or stone). This is accomplished by (a)

ensuring that no more than 50% of the reinforcement is comprised of resin and (b) using non-twisted reinforcing elements to resist the thermal expansion tendencies of the resin. As to this latter feature, twisted fibers would tend to twist, untwist, or otherwise adjust their orientation or lateral positioning within the resin under changes in temperature, thus allowing the thermal properties of the resin to predominate and warp the stone slab.

The reissue applicant submits that the prior art applied by the Examiner does not teach or suggest the method claimed herein and the resultant solution to the problem addressed by the invention.

* * *

In view of the foregoing, the reissue applicant submits that amended and new claims 39-45, 52-54, and 58-73 meet the requirements of 35 U.S.C. §§ 112 and 251 and otherwise are patentable over the prior art and other references applied by the Examiner. Accordingly, the undersigned respectfully requests withdrawal of the rejections and issuance of a Notice of Allowance for this application.

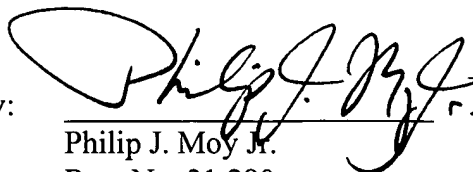
The reissue applicant has petitioned for a three-month extension of time under 37 C.F.R. § 1.136 and has submitted a check in payment of the fee for filing a Request for Continued Examination and the fee required for the submission of claims in excess of twenty (there now are a total of twenty-six claims), and a check for the extension fee. If there are any other fees due in

connection with the filing of this response, please charge those fees to Deposit Account No. 06-0308.

Respectfully submitted,

Date: May 27, 2003

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Enclosure: Appendix A

APPENDIX A

Mark-up of Amendments to Application

In the Claims:

Claims 45, 61, and 65 have been amended to read as follows (with reissue underlining omitted):

45. (Amended) The process according to claim 39, wherein the [linear] reinforcing [elements are] layer is made of metal, and the metal is steel.

61. (Amended) A process for producing a reinforced slab of stone material, comprising the steps of:

- a. providing a slab of stone material having a substantially smooth rear face [substantially] free of grooves or recesses;
- b. providing a first layer of non-twisted linear reinforcing elements coated with a resin, the percentage of resin to non-twisted linear reinforcing elements in the first layer being at most 50:50 by weight;
- c. providing a second layer of non-twisted linear reinforcing elements coated with a resin, the percentage of resin to non-twisted linear reinforcing elements in the second layer being at most 50:50 by weight;
- d. applying the first and second layers of non-twisted linear reinforcing elements to the rear face of the slab such that the second layer is between the first layer and the rear face of the slab; and
- e. hardening the resin.

65. (Amended) A process for producing a reinforced slab of stone material, comprising the steps of:

- a. providing a slab of stone material having a substantially smooth rear face [substantially] free of grooves or recesses;
- b. forming grooves or recesses on the rear face of the slab;
- c. providing a first reinforcing layer of non-twisted linear reinforcing elements coated with a resin, the percentage of resin to non-twisted linear reinforcing elements in the first layer being at most 50:50 by weight;
- d. providing a second reinforcing layer of linear reinforcing elements;
- e. applying the first and second reinforcing layers to the rear face of the slab such that the second layer is between the first layer and the rear face of the slab and the reinforcing elements of the [first] second reinforcing layer are disposed in the grooves or recesses; and
- f. hardening the resin.